Growth enhancing effect of discretionary fiscal policy shocks: Keynesian, Weak Keynesian or Non-Keynesian?

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Abstract

Using the extended version of the Blanchard and Perotti SVAR technique, this paper attempts to empirically predict the growth enhancing effect of discretionary fiscal policy shocks in both short- and long-run in Turkey over the period 2006:Q1–2015:Q1. Unlike previous studies which have mainly focused on fiscal policy instruments –taxes and government spending– at the aggregate level, this paper considers these instruments at the component level, and then attempts to analyze comparatively the effect of changes in each component on growth. The findings of the paper show that growth enhancing effect of discretionary fiscal policy shocks varies according to its components. However, discretionary fiscal policy shocks at the component level indicate mixed results. In the short-run, only the shocks to government spending have a Keynesian effect. In all other cases, discretionary fiscal policy shocks seem to capture a weak Keynesian and/or non-Keynesian effect in the case of Turkey.

Key Words: Fiscal Policy, Economic Growth, Fiscal Stimulus Packages, Fiscal Multiplier, Keynesian Effect, Non-Keynesian Effect, Weak Keynesian Effect, SVAR Technique, Turkey.

JEL Codes: E27, E32, E6, E62, H2, H30

1. Introduction

Fiscal policy has recently been on the agenda of many countries. In the aftermath of the financial and economic crisis of 2007-2009, fiscal policy ―a long neglected tool of macroeconomic policy― has received a renewed attention among academics to policy makers.

On the implementation side, with a great hope and expectation of overcoming the recent downturn or, at least, mitigating its negative effects on their economies, a number of both industrialized and developing countries have put into practice consecutive large fiscal stimulus packages. The size of these programmes has been quite remarkable in countries, ranging from nearly 2% of GDP in Europe to about 6% in the US and 13% of GDP in China (Sola, 2013). Soon after the crisis, fiscal policy in general and its effectiveness to overcome economic downturns in particular have become a major concern among academic economist and policymakers. However, the effectiveness of fiscal policy in stimulating economic activity is a highly controversial issue among scholars for a long time. Much of the controversy is related to the effect of discretionary fiscal policy, rather than its automatic stabilizer component.[1] With the financial and economic crisis of 2007-2009 and then turned into a global recession, the controversy over the effectiveness of discretionary fiscal policy has further intensified. How

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[1] The effects of fiscal policy on economic activity emerge in general through two different ways: Automatic stabilizers, and discreationary fiscal policy. Automatic stabilizers constitute nondiscreationary part of fiscal policy. In other words, they are the components of fiscal policy that automatically mitigate swings in output level without any active intervensions of government to economy through taxes and/or public spending. Unlike the active intervensions of government to economy by changes in fiscal policy instruments, –that is discreationary fiscal policy–, automatic stabilizers are automatic complience of the fiscal system to changes in economic activity.

output responds to discretionary fiscal policy changes and how to measure its effect on economic activity have become at the heart of our understanding.

Since automatic fiscal stabilizers are frequently limited in scope (IMF, 2008), the effectiveness of fiscal policy is typically evaluated through its discretionary component. It involves an active intervention by government to economy through discretionary fiscal changes ―tax hikes and/or government spending increases. More recent empirical discussions have given much attention to the effectiveness of fiscal stimulus packages which have been considered as a proxy for discretionary fiscal policy. Although the effectiveness of such packages still remains an open question (Riera-Crichton et al., 2014), it is usually linked with fiscal multiplier. In other words, the effectiveness of fiscal stimulus packages is commonly analyzed through fiscal multiplier ―that is, how much a dollar spent and/or tax hike by government creates a change in GDP. Put it simply, fiscal multiplier is the ratio of a change in GDP to a discretionary change in fiscal instruments, i.e. increase in government spending and/or tax cuts, with respect to their respective baselines.

The sign, size and sensitivity of fiscal multiplier are crucial for the measurement of discretionary changes in fiscal policy. Fiscal multiplier can take three different values; positive, negative or zero. If it is equal to one, for instance, it means that a dollar spent and/or tax cut by government leads to a dollar rise in GDP. If fiscal multiplier is greater than one, it refers to that an increase in government spending and/or a decrease in taxes results in a higher increase in GDP. In the similar vein, if fiscal multiplier takes a value between zero and one, then GDP increases, but by less than the fiscal stimulus package implemented, say, a dollar tax cut and/or a dollar public spending increase. More clearly, the desired thing with fiscal multiplier, when a discretionary fiscal policy is aimed at boosting economic activity, is to have a fiscal multiplier with a positive value as well as higher than one. Because, a fiscal multiplier with a positive value as well as higher than one implies that the expansionary fiscal policy stimulates GDP with a higher proportion or amount than itself.

This paper attempts to empirically predict the growth enhancing effect of discretionary fiscal policy shocks[2] in Turkey. Unlike many previous papers, this paper considers fiscal policy instruments at the component level rather than at the aggregate level in predicting the effects of fiscal policy on growth. The paper employs the extended version of SVAR technique ―with eight-shock variables― of Blanchard and Perotti (2002) ―hereafter abbreviated as the B-P SVAR― which is widely accepted as a relatively more appropriate model not only for the empirical studies related to fiscal policy due to the fact that fiscal policy does not accurately response to changes in economic activity because of lag problem, but also for identifying the effects of discretionary fiscal policy shocks.

The followings may be also added for the motivation why we have studied on such a topic: First and foremost, fiscal policy is not only a dynamic topic, but also its effectiveness is highly a disputable issue. Therefore, it is always possible to study on it; secondly, current fiscal policy related issues of the Turkish economy, such as relatively high size of government in the economy, sharp swings in GDP growth rates, high government debt make this policy important for Turkey and motivate us to study on it. Thirdly, to the best of our knowledge, there have been few existing studies that attempt to predict the growth enhancing effect of discretionary fiscal policy shocks considering its sub-components specifically in the context of developing countries in general with the B-P SVAR, whereas there exist few studies in the case of

[2] What we mean by fiscal policy shocks are surprise [unexpected] changes induced by the government interventions in fiscal policy –that is, an increase or decrease in taxes or government spending or both.

Turkey in particular; Fourthly, only few studies have been in the current literature analyzing the effects of fiscal policy instruments on main macroeconomic variables at sub-component basis on these countries. And finally, one more novelty of this paper is to extend the limited literature through a case study on a developing country like Turkey.

The rest of the paper is structured as follows: The next section provides a short brief note on the Turkish economy with a special emphasize on fiscal policy. Section 3 provides a theoretical background to the paper, while Section 4 reviews at greater length the related empirical literature. Section 5 then introduces econometric specification, the B-P SVAR technique and data, respectively. Section 6 reports as well as discusses the empirical findings of the paper. And finally, Section 7 offers concluding remarks.

2. Bird's Eye View of Turkish Economy with a Special Emphasize on Fiscal Policy

By any international standards, Turkey is a middle-size country. In an economic sense, it is regarded and then classified by the IMF as an emerging market economy like Brazil, Mexico, India, and China. Her current GDP per capita is well over US$10.000. According to the Medium-Term Economic Program prepared by the Ministry of Development, it is expected to go over US$ 11.000 in coming few years.

Despite all these positive developments and a great progress, Turkey has faced several economic and political turbulences as well as instabilities in her past decades. No need to go far away, just looking at the period 1990-2000, it could be seen that the political situation was highly volatile, making the country one of the most instable economies, and a country which is filled with uncertainty among other emerging market economies. Instable and uncertain circumstances of recent decades have adversely hit the economy, thereby resulting in destabilizing exchange rates, increasing budget deficits and interest rates, accumulating high government debt stock, pushing upward pressure on inflation, increasingly worsening current account deficits, and finally shrinking economic growth. These undesirable political and economic developments forced Turkish authorities to knock the door of IMF, and Turkey has become an unchanging frequenter of the IMF loans. Turkey has signed four stand-by agreements [1994, 1999, 2002, and 2005] with the IMF since 1990 as part of its stabilization programs as well as re-structuring the economy. In other words, the vast majority of these programs were put into practice under the austerity of the IMF.

Turkey faced with one of the most severe economic crisis in her history in April 1994. Just before the crisis, public sector borrowing requirement exceeded well over 10% of GDP, whereas annual CPI inflation on average peaked to almost 150%. In short, the main economic indicators worsened substantially. The main reason behind these miserable economic conditions was poor and inaccurate macroeconomic policy management, especially in the area of fiscal policy designing and management. Under these unfavorable economic conditions, the government put into practice a challenging stabilization program, what is called "April 5, 1994 Stabilization Measures". Once again, fiscal policy was on the agenda of the Turkish authorities. The sustainability of public debt and, hence, fiscal policy became a primary concern not only for the authorities, but also for the leading international financial organizations, such as the IMF and World Bank. Consequently, Turkey had to sign its 16. Stand-by agreement with the IMF. Under this agreement and with the request of the IMF, Turkey implemented primary budget surplus criteria, targeting a surplus of 6.5% of GDP. However, the agreement lasted only for 14 months and ended up with a failure and then cancelling the agreement due to its poor economic performance. To reach this target became a prime concern of fiscal policy until the 2000s.

Following a new stand-by agreement with the IMF, a three-year exchange rate-based stabilization program was put into practice just before the beginning of 2000 to bring the Turkish economy into a sustainable path by overcoming chronic structural problems as well as gradually diminishing high and volatile inflation. In particular, two things ―establishing an independent supervisory and regulatory banking authority to improve the quality of financial stability and prompting privatization implementations were put on the high agenda of the government. The program initially showed a good progress and went on its way for the first 11 months. Since then, however, the situation reversed dramatically and collapsed in November 2000 with the early signs of financial markets' stress, seeing the program unsustainable due to poor performance in maintaining the program. That crisis was followed by a more severe one, February 2001 Crisis. Soon after that, a new program based on the IMF's stand-by with a new arranged target and hope was put into practice. If stated with general terms, Turkey showed relatively better performance in the 2000s. Inflation dropped to single digits, budget deficit -to-GDP ratio alongside public debt indicators almost catched up with the stipulations of the Maastricht Treaty as regard to fiscal convergence criteria. However, income inequality, unemployment, chronic and high current account deficit, and unstable and jobless growth have maintained their presence during the decade of the 2000s. At present, most of these problems still remain unsolved for the Turkish economy.

Recent selected macroeconomic indicators of Turkey are presented in Table 1. What we see from the table at first glance, following the year 2013 with few exceptions, macroeconomic indicators of Turkey have considerably deteriorated relative to a couple of previous years. These negative developments could be possibly attributed to domestic problems and developments in international arena.

Table 1: Recent Selected Macroeconomic Indicators of Turkey, 2010 - 2014

Indicator	Unit	2010	2011	2012	2013	2014
GDP	Billion U$	732	774	786	823	810
GDP Growth Rate	%	9.2	8.8	2.2	4.1	2.8
GDP Per Capita	US$	10.079	10.444	10.497	10.807	10.537
CPI Inflation	Year end, %	6.4	10.4	6.2	7.40	8.17
Unemployment Rate	Average, %	11.9	9.8	9.2	9.7	10.4
Budget Deficit/ GDP	%	-3.6	-1.3	-2.2	-1.2	-1.3
Primary Balance/ GDP	%	0.8	1.9	1.4	2.0	1.5
C. Government Debt Stock/ GDP	%	43.1	40.1	37.6	36.2	37.7
[C. Government + Private External Debt Stock]/GDP	%	39.8	39.3	43.1	40.8	49.0
Exchange Rate	Year end, US$/TL	1.55	1.91	1.78	2.13	2.32
Current Account Deficit/ GDP	%	-6.2	-9.7	-6.0	-7.9	-5.7
Gini Coefficient	%	40.2	40.4	40.2	n.a	n.a
Central Bank's Reserves	Billion US$	86.0	88.7	125.4	124.2	126.4

Source: The Ministry of Finance, Ministry of Development, Central Bank of the Republic of Turkey, Treasury, and Turkish Statistical Institute.

3. Theoretical Background

As mentioned earlier, the effects of fiscal policy shocks are a highly controversial issue which has created serious polarization between advocates and opponents. No matter how developed the country is, with the recent fiscal stimulus packages put into practice in a number of countries; such discussions have re-sparked off in academic and non-academic circles.

The focal point of discussions has been on the effectiveness of fiscal policy and thus whether its effect has been the Keynesian, non-Keynesian or weak Keynesian. Discretionary fiscal policy shocks may affect either demand-side or supply-side of an economy, or both. For instance, the Keynesian view claims that fiscal policy is effective on demand-side factors, whereas some others assert that it affects very much supply-side of the economy. This disagreement arises largely from the theoretical models and their assumptions in which fiscal policy measures put into practice [Briotti (2005), Arestis (2011)].

Keynes is the pioneering scholar of the idea of active involvement of government to the economy through fiscal policy. He argued that an expansionary fiscal policy affects aggregate demand and thus output level of the economy through fiscal policy multiplier under assumptions of price-wage rigidity, excess capacity and liquidity constrained economic agents. Put it more simply, the Keynesian view concentrates fully on demand-side of the economy and postulates that discretionary fiscal policy changes affect economic activity in the short-run.[3] In other words, an expansionary fiscal policy causes multiplier effect on aggregate demand and thus on output ―that is greater than one and changes by depending on marginal propensity to consume. According to the Keynesian multiplier concept, the multiplier effect of a government spending increase is larger than that of a tax cut. If a government spending increase is solely financed through an increase in taxes, in this case the multiplier is called "balanced budget multiplier" which is equal to one.

However, the Keynesian view has been challenged by new classical view with the argument of perverse effects of fiscal policy –so-called "non-Keynesian effects of fiscal policy"[4] [Hemming et al. (2002), Siwińska and Bujak (2003)]. New classical view emphasizes very much on supply-side effects of fiscal policy neglected by the Keynesian view, rather than its demand-side effect. In particular, it points to the lack of microeconomic foundations of the Keynesian view.

The 1990s witnessed a challenge to the Keynesian view with the seminal work of Giavazzi and Pagano (1990). This work has been followed by many others, such as Alesina and Perotti (1997), and Alesina and Ardagna (1998, 2010). They all argued that contractionary fiscal policy could have a positive impact on economic activity. This argument was obviously contradicting the Keynesian view as well as traditional wisdom among macroeconomists. Since then, whether fiscal policy is Keynesian, weak Keynesian or non-Keynesian has become the one of the focal point of macroeconomic policy discussions.

In contrast to the Keynesian view, the opposite view focuses to a large extent on supply-side effects of fiscal policy on the economy, rather than demand-side effects of it. Demand-side effect shows itself through expansionary or contractionary fiscal policy which changes positively or negatively the economic agents' expectations with regard to their future disposable income and wealth. However, supply-side effects arise through labour market efficiency and subject to the competitiveness of the economy. In fact, arguments regarding the non-Keynesian effects of fiscal policy arise from new classical view which greatly emphasizes supply-side factors [Hemming et al. (2002)], neglected by Keynes. Furthermore, the opposite view advocates non-Keynesian effects of fiscal policy which are appraised in the context of Ricardian equivalence theorem, rational expectations, credibility, and positive growth effects of consolidation [See, i.e, Alesina and Perotti (1997), Alesina and Ardagna (1998, 2010), Siwińska and Bujak (2003)].

[3] To be reminded here that the growth effect of discretionary fiscal policy changes is well illustrated by the standard IS-LM model.

[4] We express here that it is also named commonly as "*expansionary fiscal contraction*", and rarely as "*anti-Keynesian*" in the literature.

Fiscal multiplier is an important concept for fiscal policy. The effect of discretionary fiscal policy is typically measured and assessed in accordance with fiscal multiplier (Candelon and Leib, 2013). As noted earlier, it measures the impact of a discretionary change in fiscal policy instruments, i.e. taxes and/or government spending, in terms of GDP response.

In a nutshell, Table 2 summarizes the effects of fiscal policy on economic activity in accordance with the sign and size of the fiscal multiplier. The sign and size of the multiplier may vary considerably depending on a number of factors, such as the characteristics of the economy[5], types of fiscal policy instruments used, global industry shocks, and country-specific regulations that may vary by industry [See, IMF (2008)].

Table 2: Effects of Discretionary Fiscal Policy on Economic Activity by the Sign and Size of the Fiscal Multiplier

Sign and Size of the Fiscal Multiplier [k]	Effect of Fiscal Policy	Basic Assumptions
$k \geq 1 \Rightarrow$	Keynesian	✓ Excess capacity ✓ Price-wage rigidity ✓ Consumption is related to current income
$1 > k > 0 \Rightarrow$	Weak Keynesian	✓ Productive capacity of economy closes to full use ✓ Market interest increases ✓ Exchange rate appreciation
$0 > k$ or negative $\Rightarrow$	Non-Keynesian	✓ Intertemporal optimization ✓ Large fiscal imbalances ✓ Risk premium on interest rates ✓ Taxes are distortionary: Larger tax increases lead to larger distortionary effects. ✓ Agents are forward-looking and not liquidity constrained ✓ Agents are rational in forming their expectations ✓ Credible fiscal consolidation
$k = 0 \Rightarrow$	Ricardian Equivalence	✓ No matter how government deficit is financed, whether with debt or tax financing, the outcome would be the same and demand would remain unchanged. ✓ Agents are fully aware of government's intertemporal budget constraint ✓ Agents are forward-looking ✓ No liquidity constraints

Source: Arranged by the Authors

4. Review of the Related Empirical Literature

With the financial and economic crisis of 2007-2009, fiscal policy and its role in stimulating economic activity have regained interest. Its role in mitigating business cycles, especially during downturn terms as in the case of the recent global recession, has been paid a great attention among large circles. In this context, the concentration has been given to the effectiveness of fiscal stimulus packages which have been put into practice as a response to the recession. Among many others, some leading studies are like Caldara and Kamps (2008), Feldstein (2009), Mountford and Uhlig (2009), Arestis (2011), Barro and Redlick (2011), Afonso and Sousa (2011, 2012), Alesina (2012), Coenen et al. (2012a), Auerbach and Gorodnichenko (2012), Ilzetzki et al. (2013), and Caggiano et al. (2015) have recently analyzed this issue.

Some of the studies above look the issue at single country level [Cerda et al. (2006), Giordano et al. (2007), Mountford and Uhlig (2009), Ahumada (2009), Spilimbergo et al. (2009), Ali and Ahmad (2010), Kuismanen and Kämppi (2010), Pereira and Roca-Sagalés (2011), Ben-Sliamne

[5] They contain, inter alia, institutional factors related to fiscal policy, the degree of monetary policy accommodation, the extent of market rigidities, globalization and openness of the country to international trade, exhange rate regime, size of the government, and existance as well as degree of regulation on financial markets and accessing opportunities to global capital.

et al. (2011), and Yadav et al. (2012), Caggiano et al. (2015), among others], whereas some others look at the issue in the context of a specific group of countries, such as the OECD countries, the Euro Area, ASEAN countries, etc. For these types of studies, the followings may be listed to see at first glance: Arcangelis and Lamartina (2003), Kneller et al. (1999), Gemmell et al. (2011), Coenen et al. (2012a), Cottarelli and Jaramillo (2012), and Tang et al. (2013).

In recent years, however, in particular at the onset of the recent crisis, studies analyzing the impact of fiscal policy shocks have focused greatly on the size, sign and sensitivity of fiscal multiplier to measure the effectiveness of fiscal stimulus packages [See, Romer and Romer, (2010), Alesina and Ardagna (2010), Auerbach et al. (2010), Gemmell (2011), Barro and Redlick (2011), Auerbach and Gorodnichenko (2012), Ilzetzki et al. (2013), among many others].

The study by Knell et al. (1999) investigated whether the impact of fiscal policy shocks on growth depends on the structure as well as the level of taxation and expenditure by using a panel data for 22 OECD countries[6] over the period 1970-1995. They found that increasing productive expenditure[7] or reducing distortionary taxes[8] by 1% of GDP raises the growth rate by 0.1-0.2% per year. Based upon their findings, they concluded that i) distortionary taxes reduce growth, but not non-distortionary taxes; ii) productive government expenditure positively affects growth, but not non-productive expenditure.

In their highly influential study, Blanchard and Perotti (2002) searched for the effects of fiscal policy shocks on GDP in the US by employing the B-P SVAR technique. Their paper displayed that fiscal policy does not have any positive effect on GDP in this country. On the contrary, they found a negative effect of fiscal policy shocks on GDP, what they called "non-Keynesian effect". Perotti (2005) also examined the impact of fiscal policy by using the same approach but with a five-variable SVAR on GDP in five OECD countries –the USA, the UK, Germany, Canada, and Australia. His findings are almost parallel to the findings of Blanchard and Perotti (2002), confirming the non-Keynesian effect of fiscal policy with the following two arguments: i) the effect of expansionary fiscal policy shocks on GDP is insignificant: Increases in government spending and reductions in taxes have smaller multipliers in the post-1980 period; ii) The effects of government spending and tax cuts on GDP and its components have substantially become weaker over time.

Giordano et al. (2007) investigated the effects of fiscal policy shocks on GDP, inflation and the long-term interest rate in Italy by using a structural autoregression model for the period 1982:Q1-2004:Q4 and then they concluded that a shock to government purchases of goods and services has a sizeable and robust effect on economic activity in Italy. In the similar vein, Kuismanen and Kämppi (2010) found that fiscal policy shocks significantly affect the economic activity in Finland, indicating that a positive tax shock seems to have a positive effect on GDP, whereas an increase in government spending crowds-out private sector activities, resulting in a reduction in GDP. On the other hand, Mountford and Uhlig (2009) investigated the effects of

[6] Consist of Australia, Austria, Canada, Denmark, Finland, Germany, Iceland, Luxembourg, the Netherlands, Norway, Spain, Sweden, Turkey, the UK, the USA, France, Belgium, Greece, Switzerland, Italy, Portugal, and Ireland.

[7] As it is expressed in the study, government expenditures are differentiated according to whether they are included in the private production function or not. If they are, then they are classified as productive and hence have a direct effect upon the rate of growth. If they are not then they are classified as unproductive expenditures and do not affect the steady-state rate of growth.

[8] Distortionary taxes refer to taxes which affect the investment decisions of agents with respect to physical and/or human capital, creating tax wedges and hence distorting the steady-state rate of growth. Non-distortionary taxation does not affect saving/ investment decisions due to the assumed nature of the preference function, and, hence, has no effect on the growth rate.

fiscal policy shocks by applying a VAR model to 1955-2000 US data. Based upon their empirical findings, they argued that deficit-financed tax cuts policy gives better results in relation to the others [deficit-spending, deficit-financed tax cuts, and a balanced budget spending expansion] to improve GDP, with a maximal present value multiplier of five dollars of total additional GDP per each dollar of the total cut in government revenue 5 years after the shock. Imposing the same model on the same country, Sola (2013) examined fiscal policy shocks from a different perspective, dividing them into two as temporary and permanent shocks. He found, among others, that temporary fiscal expansions positively affect output, while the latter negatively affect output, but with a lesser extent.

On the other hand, some recent studies have focused on the sign, size and sensitivity of fiscal multiplier to measure the effectiveness of fiscal stimulus packages. In this regard, three influential studies may be referred to the studies of Barro and Redlick (2011), Auerbach and Gorodnichenko (2012), and Ilzetzki et al. (2013). For instance, the study of Ilzetzki et al. (2013) searched for the macroeconomic effects of fiscal stimuli in 44 industrialized and developing countries by implementing panel SVAR techniques. They asserted that the impact of government expenditure shocks depends crucially on country-specific conditions, such as the level of development, exchange rate regime, openness to trade, and public indebtedness. They concluded that, among the others,: i) the fiscal multipliers in open economies are smaller vis-á-vis closed economies; ii) the fiscal multipliers in high-debt countries are smaller or even negative; iii) the fiscal multiplier is relatively large in economies operating under predetermined exchange rates but is zero in economies operating under flexible exchange rates.

Although the existing empirical literature is quite rich in terms of the studies analyzing the effect of fiscal policy shocks through fiscal multiplier, the vast majority of these studies consider the issue from the perspective of industrialized countries rather than developing ones. However, in reviewing the literature we observe that in the past few years there have been an increasing number of studies which have especially examined the fiscal multiplier in the context of developing countries. The studies by Pereira and Roca-Sagalés (2011), Ben-Sliamne et al. (2011), Çebi (2015), Mitra and Poghosyan (2015) are only some of them. Hereafter, we will review in detail some of these studies to shed light our paper.

Pereira and Roca-Sagalés (2011) examined the long-term effects of fiscal policy shocks on output in Portugal over the period 1977-2004 by employing a VAR approach. They concluded that the impacts of fiscal policy shocks are consistent with the Keynesian view. More specifically, both direct taxation and public investment created the Keynesian effect, whereas intermediate public consumption and indirect taxation had the non-Keynesian effect but with negligible effects. Another study on the same country by Afonso and Sousa (2011) investigated non-Keynesian effects were seen for the macroeconomic effects of fiscal policy in Portugal by using a developed version of the SVAR technique ―a Bayesian Structural Vector Autoregression model. They observed that expansionary government spending shocks have, in general, a negative effect on real GDP, whereas government revenue shocks have a positive effect. In a related, but different, study by Afonso and Sousa (2012) applied the same model for four industrialized countries[9]. However, they found that the effects of both government spending and revenue shocks on GDP are positive, but the former has, in general, a smaller impact on GDP compared to the others.

[9] These countries are the US, the UK, Germany and Italy.

Focusing on Chile for the period 1970-2000 and using an estimated SVAR technique, Cerda et al. (2006) examined whether the effects of fiscal policy shocks are Keynesian or non-Keynesian. They found the evidence of the non-Keynesian effects. Accordingly, a 1% fiscal expenditure shock led to a negative impact on GDP by nearly -0.2 % in the first year. However, the impact later became insignificant. On the other hand, a 1% of tax revenue shocks resulted in -0.1% decrease in GDP in the first year, but there were no significant impacts in the following years. In a VAR-based study, de Castro (2006) reached similar results for Spain, confirming that fiscal policy shocks create significant non-Keynesian effects on GDP.

A study on Tunisia by Ben-Sliamne et al. (2011) found weak or non-Keynesian effects of fiscal policy, like the study of Cerda et al. (2006). Their empirical findings confirmed that fiscal policy shocks have a weak Keynesian effect on the economic activity, reflecting the general characteristic of fiscal multiplier in developing countries, –that is, very low Keynesian multiplies, exceeding "1" for neither short- nor long-run in Tunisia. A similar study on India by Yadav et al. (2012) concluded, among others, that the shock to tax variable has a bigger impact on GDP than the shock to government spending. Besides, their study indicated that in the short-run, the impact of expansionary fiscal shocks is the Keynesian, whereas in the long-run the results are mixed.

A recent study by Tang et al. (2013) analyzed the effectiveness of fiscal policy in ASEAN5 countries[10] for the period 1990:1-2009:4 by implementing a time-varying VAR approach, an extended version of the B-P SVAR. Their findings showed that for government spending, the fiscal multiplier is highly small, much less than 1, and statistically insignificant in the all countries. However, they found for taxes, which are a consistent pattern of output expansion with fiscal contraction, the fiscal multiplier is only statistically significant for the countries of Indonesia and Thailand. Another very recent study on 10 Asian emerging economies[11] by Jha et al. (2014) found that tax cuts have a greater countercyclical impact on output than government spending in the aforementioned countries.

To the best of our knowledge, in reviewing the literature it seems that there have been only two main studies [Çebi (2010, 2015)] which highlight the same issue as we do. For instance, Çebi (2015) estimated the size of the government spending multiplier in Turkey for the period 2002:Q1-2014:Q4. According to his findings, a positive shock to government spending tends to increase output, taxes, real interest rate and the size of the fiscal multiplier is relatively large at the first few quarters. On the other hand, the results show that government investment expenditure rather than consumption expenditures has a significant effect on output at the first few quarters. The main difference of our study from Çebi (2015) is that we analyze not only the short-term like Çebi (2015), but also long term effects of fiscal policy. Additionally, Çebi (2015) considers only one instrument of fiscal policy, that is, government spending. However, we consider the both tools of fiscal policy. Unlike the study of Çebi (2015), we analyze the effects of fiscal policy at the component level designed for the Turkish budget system.

In reviewing the literature, one can observe that the empirical studies predicting the growth enhancing effect of fiscal policy shocks have focused heavily on industrialized countries, in particular on the US, except few recent studies on developing countries. In addition, a large majority of these studies have produced mixed results. In short, the subject of the impact of fiscal policy shocks on growth is a matter of controversy. It needs to be stressed, nonetheless, that it

[10] These countries consist of Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

[11] These countries are China, Hong Kong, India, Indonesia, Korea, Malaysia, Thailand, Taiwan, Singapore, and the Philippines.

should be seen usual. The relationship between fiscal policy and economic growth is a complex issue, and its complexity arises from various kinds of feedback loops between one and the other (Cottarelli and Jaramillo, 2012). Having considered the importance of growth for all countries, no matter how developed country is, and for which fiscal policy has critical implications not merely in short-run, but also in the long-run, we strongly believe that it would not be a time consuming to do more studies about the effect of fiscal policy shocks on growth, until reaching a consensus on it.

5. Econometric Specification, the B-P SVAR Technique and Data

This paper attempts to predict the growth enhancing effect of fiscal policy shocks in Turkey for the period 2006:Q1-2015:Q1 by using the extended version of the B-P SVAR. The main purpose in this paper is to investigate whether sub-components of fiscal policy instruments have growth enhancing effect. Accordingly, we divided taxes and government spending into their sub-components in line with the Turkey's budgetary system. More explicitly, we grouped taxes into four as value added tax, special consumption tax, personal income tax and corporate income tax, whereas classifying government spending into three groups as personal, current transfer, and interest spending.

5.1. Econometric Specification

In this paper, we employed the B-P SVAR and its extended version by Perotti (2005). However, we did not borrow their model directly. We use its augmented form with eight variables to capture well the growth enhancing effects of each of sub-components of fiscal policy instruments.

Some advantages of using the B-P SVAR technique can be itemized as follow: i) Based on the estimation of the multivariate autoregressive vector systems, it allows us to capture the impact of the fiscal policy under normal times [Ben-Sliamne et al. (2011)]; ii) The B-P SVAR assist to identify fiscal shocks in the data together with other shocks by imposing sign restrictions for the identification of each shock; iii) The B-P SVAR assist to capture much better results compared with large-scale econometric models or reduced-form approach. Blanchard and Perotti (2002) argue that large-scale econometric models deal largely with the postulate of an effect of fiscal policy on economic activity rather than its documentation. As for the reduced-form approach, it engages the effects of summary statistic of fiscal policy.

Even though, traditionally, the SVAR technique has been used to evaluate the effects of monetary policy shocks until last two-three decades [Arcangelis and Lamartina (2003), Lozano and Rodrı´guez (2011), Ben-Sliamne et al. (2011), Arestis (2011), Jha et al. (2014)], there has been a considerably expanding literature examining the effect of fiscal policy shocks with the SVAR in the last decade. However, most of these studies deal with industrialized countries such as the US, and some EU countries, rather than developing countries. To our best knowledge, the existing studies in relation to developing countries are only limited with the studies of Cerda et al. (2006), Ahumada (2009), Çebi (2010), Ben-Sliamne et al. (2011), Lozano and Rodrı´guez (2011), Yadav et al. (2012), Tang et al. (2013), and Jha et al. (2014).

It would be important noting here that the B-P SVAR cannot be directly estimated because the parameters in the matrices are unknown and the variables have contemporaneous effects on each other–that is, there is a correlation between the independent variables and ε_t and thus OLS estimator will produce biased and inconsistent estimates. Since a standard VAR is concerned as a reduced form of the dynamic structural model, and there are no contemporaneous effects

between variables in the reduced form, OLS can be used to estimate the parameters in the reduced form equation.

In general, what we have seen from the literature at the first glance is that in previous empirical studies aiming to identify the effect of discretionary fiscal policy shocks on macroeconomic variables mostly one of the following three techniques is employed:

i) Structural macroeconomic techniques [See, i.e. Baxter and King (1993), Roeger and in't Veld (2010), Coenen et al. (2012b)],
ii) Narrative techniques [See, i.e. Ramey and Shapiro (1998), and Romer and Romer (2010), Ramey (2011)],
iii) or, most commonly, VAR technique [See, i.e. Fatas and Mihov (2003), de Castro (2006), Giordano et al. (2007), Caldara and Kamps (2008), Kneller et al. (1999), Ahumada (2009), Mountford and Uhlig (2009), among many others].

However, this paper considers none of these. Instead, it introduces an econometric technique proposed by Blanchard and Perotti (2002) and its augmented version by Perotti (2005) by further extending it with seven fiscal shocks variable to predict growth enhancing effect of sub-components of fiscal policy instruments. To do so, first, we augmented the number of the B-P SVAR variables in its original form, and then calibrated its extended version with seven fiscal shock variables SVAR to quarterly data for Turkey for the period 2006:Q1–2015:Q1. Totally, the number of variables used in the model is eight: Seven fiscal variables [value added tax, special consumption tax, personal income tax, corporate income tax, personal spending, current transfer spending, and interest spending] plus GDP growth rate.

We start with a VAR which is an equation, an *n*-variable linear model in which each variable is explained by its own lagged value plus current and past values of the remaining *n*–1 variables. The structural form of an *n*-variable VAR approach is (Yadav et al, 2012):

$$A_0 X_t = \sum_{i=1}^{k} A_i X_{t-i} + B_{e_t} \quad [1]$$

where e_t is white noise. Denoting the vector of endogenous variables by X_t and the vector of reduced form residuals by U_t the reduced form VAR can be represented as follows:

$$X_t = \mathrm{A(L)} X_{t-1} + U_t \quad [2]$$

Where X_t is a Nx1 vector of endogenous variables, A(L) is a NxN matrix lag polynomial, and U_t is a Nx1 vector of reduced form innovations which are assumed to be independently and identically distributed with covariance matrix equal to the identity matrix. In our benchmark specification X_t and U_t consist of the following variables:

$$X_t = [gdp_t, vat_t, sct_t, pit_t, cit_t, prs_t, cts_t, is_t]'$$

$$U_t = \left[u_t^{gdp}, u_t^{vat}, u_t^{sct}, u_t^{pit}, u_t^{cit}, u_t^{prs}, u_t^{cts}, u_t^{is}\right]'$$

The reduced form innovations of the government spending and net taxes equations as linear combinations of the structural fiscal shocks e_t^{prs} and e_t^{vat} to these variables and the innovations of the other reduced form equations of VAR, namely; $e_t^{sct}, e_t^{pit}, e_t^{cit}, e_t^{cts}\ e_t^{is},\ e_t^{gdp}$.

Where U_t is the corresponding vector of reduced form residuals with non-zero cross correlations. The relationship between the reduced form residuals and structural form residuals can be expressed as follows (Yadav et al, 2012):

$$e_t = B^{-1}A_0U_t \quad [3]$$

Where, the matrix A_0 describes the contemporaneous relationship among the variables in vector X_t. The residuals of structural shock are uncorrelated with the variance and covariance matrix being diagonal. To identify the system -A Matrix, Matrix B and the diagonal elements of VAR covariance matrix- restrictions need to be imposed.

For a two-variable VAR the structural form is as follows:

$$\begin{aligned} x_{1t} + b_{12} + x_{2t} &= b_{10} + g_{11}x_{1t-1} + g_{12}\, x_{2t-1} + e_{1t} \\ x_{2t} + b_{21}\, x_{1t} \quad &= b_{20} + g_{21}x_{1t-1} + g_{22}\, x_{2t-1} + e_{2t} \end{aligned} \quad [4]$$

The reduced form is:

$$x_{1t} = \alpha_{10} + \alpha_{11}x_{1t-1} + \alpha_{12}x_{2t-1} + u_{1t}$$

$$x_{2t} = \alpha_{20} + \alpha_{21}x_{1t-1} + \alpha_{22}x_{2t-1} + u_{2t} \quad [5]$$

from Equation 4 and 5 the reduced form error terms can be expressed as follows:

$$u_{1t} = (e_{1t} - b_{12}e_{2t})/(1\text{-}b_{12}\, b_{21})$$

$$u_{2t} = (e_{2t} - b_{21}e_{1t})/(1\text{-}b_{12}\, b_{21}) \quad [6]$$

In a two variable VAR model the reduced form of the model yields only nine parameter values: six coefficients estimates ($\alpha_{10}, \alpha_{20}, \alpha_{11}, \alpha_{12}, \alpha_{21}, \alpha_{22}$) and the estimates of variance (u_{1t}), variance (u_{2t}) and covariance (u_{1t}, u_{2t}), whereas the structural form requires the estimation of 10 parameters ($b_{10}, b_{20}, g_{11}, g_{12}, g_{21}, g_{22}, s_1, s_2$) and the two feedback coefficients b_{12} and b_{13} (Yadav et al., 2012).

Therefore, to estimate the structural form of the model from the reduced form requires certain identification restrictions. The vector moving-average representation of the model can be expressed as:

$$X_t = \text{m} + \sum j_i\, e_{t-j} = 0 \ldots. \text{infinity} \quad [7]$$

The matrix (j_i) can be used to generate the effects (or more popular called the impulse responses) of structural shocks e_t 's on the time paths of the variables X_t's. The within period response coefficients of (j_i) the matrix are the impact multipliers. For examples j_{12} (0) is the instantaneous impact of a one-unit change in variable X_2 on variable X_1. The element j_{12} (1) is the one-period response effect of X_1 to a unit change in X_2. These effects can be accumulated to obtain the cumulative multipliers (Yadav et al., 2012).

5.2. The B-P SVAR Technique

The identification restrictions of the B-P SVAR can be stated as a class of the model in matrix form as follows (Tang et al., 2013):

$A\varepsilon_t = BU_t$

$$\begin{bmatrix} 1 & 0 & \alpha_{13} \\ 0 & 1 & \alpha_{23} \\ \alpha_{31} & \alpha_{32} & 1 \end{bmatrix} \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix} = \begin{bmatrix} b_{11} & b_{12} & 0 \\ b_{21} & b_{22} & 0 \\ 0 & 0 & b_{33} \end{bmatrix} \begin{bmatrix} u_{1t} \\ u_{2t} \\ u_{3t} \end{bmatrix}$$

A is NxN matrix of contemporaneous relations among variables, ε_t is the vector of the normally independently distributed reduced form residuals with variance-covariance. $E(\varepsilon_t \varepsilon_t') = \Sigma$, B is a nxn matrix that allows some shocks to affect more than one endogenous variable in the model; and U_t is the vector of structural shocks of policy and non-policy variables, where U_t ~N(0,In) and $E(U_t U_s) = 0$ for t≠s.
For a three variable fiscal VAR model ordered as (G, T, Y) the reduced form residuals are linear combinations of the underlying structural shocks in the three variables and can be expressed as (Yadav et al, 2012):

$$u_t^g = \alpha_{gy} u_t^y + \beta_{gt} e_t^t + e_t^g \quad [8]$$

$$u_t^t = \alpha_{ty} u_t^y + \beta_{tg} e_t^g + e_t^t \quad [9]$$

$$u_t^y = \alpha_{yg} u_t^g + \alpha_{yt} u_t^t + e_t^y \quad [10]$$

Equation 8 states that the unexpected movement in the government spending variable within a quarter is due to unexpected movements in output (a_{gy}) or to the response to a structural shock to taxes (b_{gt}) or as the response to its own structural shock (e_t^g). A similar interpretation can be applied to Equation 9. For Equation 10, the unexpected movement in output (u_t^y) is a response to unexpected movement in spending (a_{yg}) or to unexpected movements in taxes (a_{yt}) or due to the other unexpected shocks e_t^y. Blanchard and Perotti (2002) noted that when quarterly data is used, the a_{gy} and a_{ty} variables consist only of the automatic responses, component (i) as explained above, as it takes more than a quarter for the systematic discretionary response of policymakers and (ii) to an output shock. When a quarterly data is used, the second component (iii) is absent. They used institutional information on taxes and government spending to construct the parameters a_{gy} and a_{ty} the elasticity of spending and taxes to GDP, respectively (Yadav, et al., 2012).

Using the elasticity values, the cyclically adjusted fiscal shocks can be determined as:

$u_t^t = u_t^t - \alpha_{ty} u_t^y$
$u_t^g = u_t^g - \alpha_{gy} u_t^y = u_t^g$
$\alpha_{gy} = 0$

Blanchard and Perotti (2002) took the value of a_{gy} as zero because they could not find any automatic feedback from economic activity to government spending. Given the values of a_{gy} and a_{ty}, u_t^t and u_t^g can then be used as instruments to capture a_{yg} and a_{yt} in a regression of u_t^g and u_t^t. Now the identification of fiscal shocks requires the estimation of only two coefficients b_{gt} and b_{tg}. Using the agnostic approach they identify the model under two alternative assumptions:

β_{gt} = 0 estimate β_{tg}
β_{tg} = 0 estimate β_{gt}

When the correlation between u_t^g and u_t^t is very low the actual ordering does not matter for calculating the impulse responses of output.

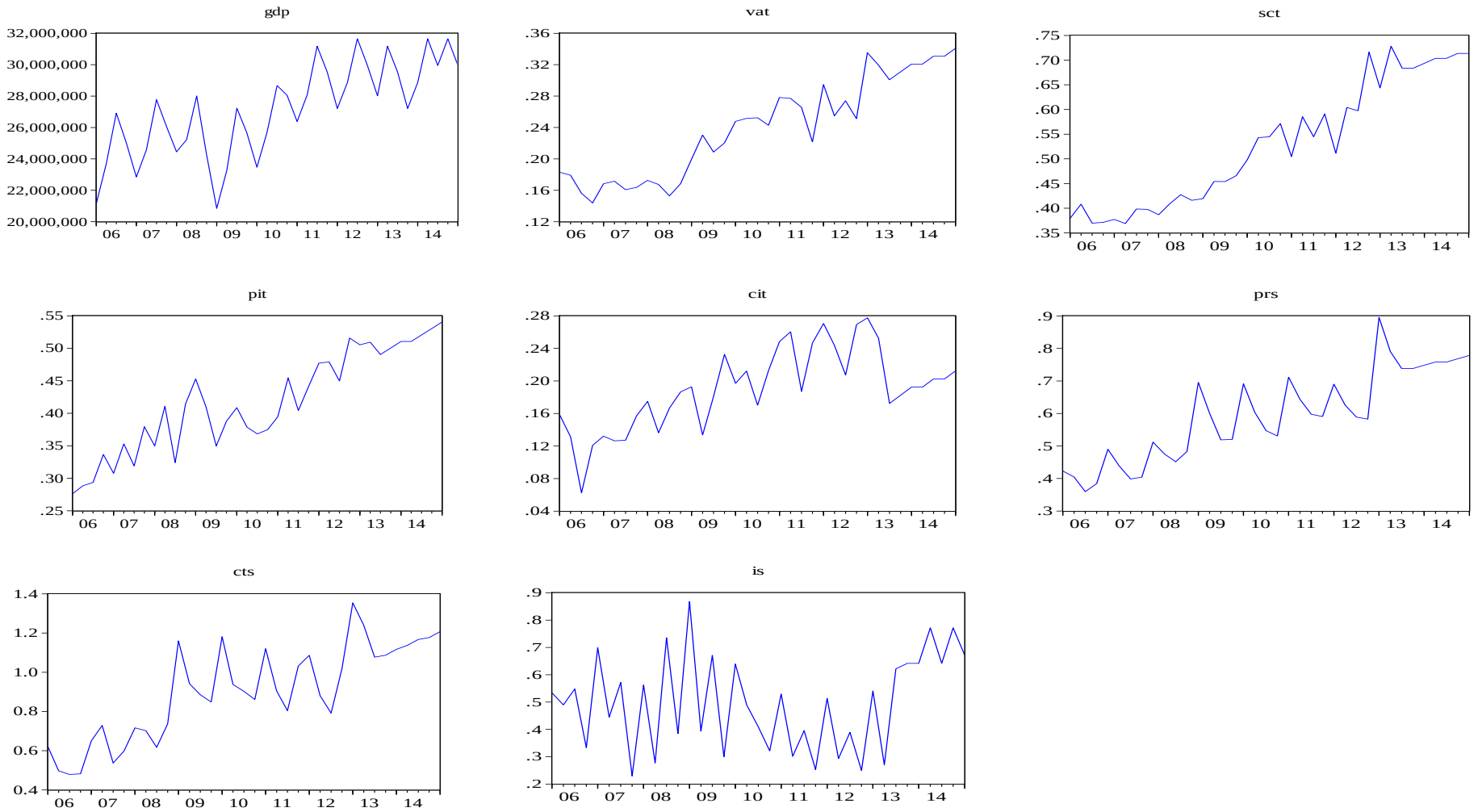
5.3. Data

In this paper, we employ quarterly time-series data for Turkey, ranging from 2006:Q1 to 2015:Q1. The reason for initiating the series from the year 2006 is that the Turkish budgetary system was substantially amended in the year 2003 and the amendments were put into practice at the beginning of the fiscal year 2006. So, in order to avoid dissimilarity of series and to make data comparable, we took into consideration the year 2006 onwards as the estimation period. In addition, we preferred to study with quarterly data owing to the fact that it allows us to identify growth enhancing effects of discretionary fiscal policy shocks more precisely. The data used in the paper comes from two main data provider: Ministry of Finance, and Ministry of Development.

The denotation of the variables used in this paper is, in turn, as follows: “gdp” denotes GDP growth rate, “vat” denotes value added tax, “sct” denotes special consumption tax, “pit” denotes personal income tax, “cit” denotes corporate income tax, “prs” denotes personal spending, “cts” denotes current transfer spending, and finally “is” denotes interest spending. All the variables are typed in the ln(log) form of in year “t”. Incidentally, it is noteworthy to express here that the series are seasonally adjusted.

The visual representation of the series is depicted in Figure 1. The series encompass gdp, vat, sct, pit, cit, prs, and cts, respectively and cover the period 2006:Q1-2015:Q1 we studied on. As can be seen from the figure, all the variables have a clear trend, except one variable –that is, interest spending. Contrary to the other variables, it does show a fluctuating trend over the whole period. In short, out of interest spending, all the other variables are stationary and display a steadily rising trend after the mid-2009s.

Figure 1: Visual Presentation of the Series, 2006:Q1-2015:Q1



Source: Prepared by the Author

6. Empirical Findings

The specification and estimation method of the B-P SVAR depend on certain properties of the variables of the model. Before proceeding with the estimation of the model, therefore, it is necessary to be determined whether the variables are difference stationary or trend stationary.

As shown in Table 3, the ADF unit root test and stationary results indicate that the null hypothesis of unit roots could not be rejected for all fiscal policy variables in level form. The null hypothesis, however, was rejected when the ADF test is applied to the first differences for all the variables. The results were reported in Table 3. As shown from the table, the ADF unit root test results suggest that all the variables are difference stationary.

An important aspect of empirical research on the specification of VAR models is the determination of the lag order of the autoregressive lag polynomial since all inferences in the VAR model depend on the correct model specification. We identified the order of the VAR model using the Akaike Information Criterion (AIC), Schwarz Information Criteria (SC), and Hannan-Quinn Information Criteria (HQ). They all suggest a VAR model of order one. As for the optimal lag length criteria, they are described in Table 4. In reference to the test of stationary of unit root of the ADF, it appears that the variables are stationary in first differences, of which the specification includes the possibility to have terms of moving average in addition to the autoregression terms.

Figure 2 indicates the inverse unit roots which are in the interior of the circle. Thus, one can affirm that the selected VAR is stationary. It can be seen from Figure 2 that all the roots lie within the unit circle, implying that the model is stable and hence we can move to the next step of the analyzis.[12]

The B-P SVAR is performed through impulse response and variance decomposition analyzis. To do so, we deal firstly with the impulse response functions and then we focus on variance decomposition analyzis.

[12] All diagnostic (misspecification) tests results can be obtained from the authors upon request.

Table 3: ADF Unit Root Test and Stationary Results, 2006:Q1-2015:Q1

ADF Unit Root Tests						
Variables	Level Constant	Critical Value		First Difference Constant and Trend	Critical Value	
		1 %	5 %		1 %	5 %
gdp	-0.3430	-3.7240	-2.9562	-16.8628(1)**	-4.3239	-3.5806
vat	-0.7665	-3.7114	-2.9810	-7.1635(1)**	-4.3098	-3.5742
sct	-0.7784	-3.6998	-2.9762	-12.4821(1)**	-4.3098	-3.5742
pit	-0.7771	-3.6998	-2.9762	-9.3669(1)**	-4.3098	-3.5742
cit	-2.2840	-3.6998	-2.9762	-8.9344(1)**	-4.3239	-3.5806
prs	-1.4441	-3.7529	-2.9980	-7.3966(1)**	-4.3239	-3.5806
cts	-1.3742	-3.7378	-2.9918	-7.2203(1)**	-4.3239	-3.5806
is	-2.2801	-3.6793	-2.9677	-21.4515(1)**	-4.3098	-3.5742

Note: The number in parenthesis indicate the selected lag order of the ADF models. Lags are chosen based on Akaike Information Criterion (AIC). The critical values are obtained from MacKinnon (1991) for the ADF test. These tests examine the null hypothesis of a unit root against the stationary alternative. Asterisk (*) denotes statistical significance at 10 %. E-Views 6.1 was used for computations.

Source: Computed by the Authors

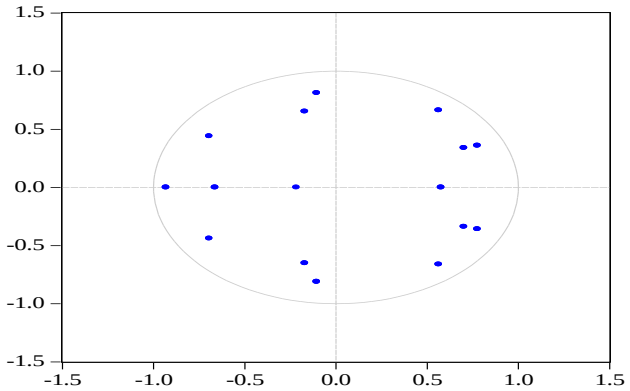
Table 4: Selection of Lag Length

Number of Lags	Log Likelihood Function	LR	Final Prediction Error (FPE)	Akaike Information Criteria (AIC)	Schwarz Information Criteria (SC)	Hannan-Quinn Information Criteria (HQ)
0	300.5099	NA	2.24e-18	-17.96620	-16.08027	-17.37555
1	413.9251	125.1478	1.25e-19	-11.37414*	-16.00074*	-15.83846*

Note: Asterisk (*) donates lag order selected by the criterion. E-Views 6.1 was used for computation.

Source: Computed by the Authors

Figure 2: Inverse Roots of the Characteristic Polynomial, 2006:Q1-2015:Q1



Source: Prepared by the Authors

6.1. Impulse Responses

The impulse response functions are used to examine the dynamic responses of the variables to various shocks with in the SVAR technique. Having identified the structural shocks, we can then find the impulse response of a variable to a one-time shock to any variable included in the model. The impulse response traces the effect on current and future values of the endogenous variables of one standard deviation shock to the variables. It is also illustrated for the sample up to 10 years to focus on the short-run dynamics.

The accumulated impulse responses are presented with the course of 10 years in our sample. All the shocks are standardized to 1%; and thus vertical axis indicates the percentage of the approximate variation of the variable in responses to 1% of shock on the GDP growth rate.

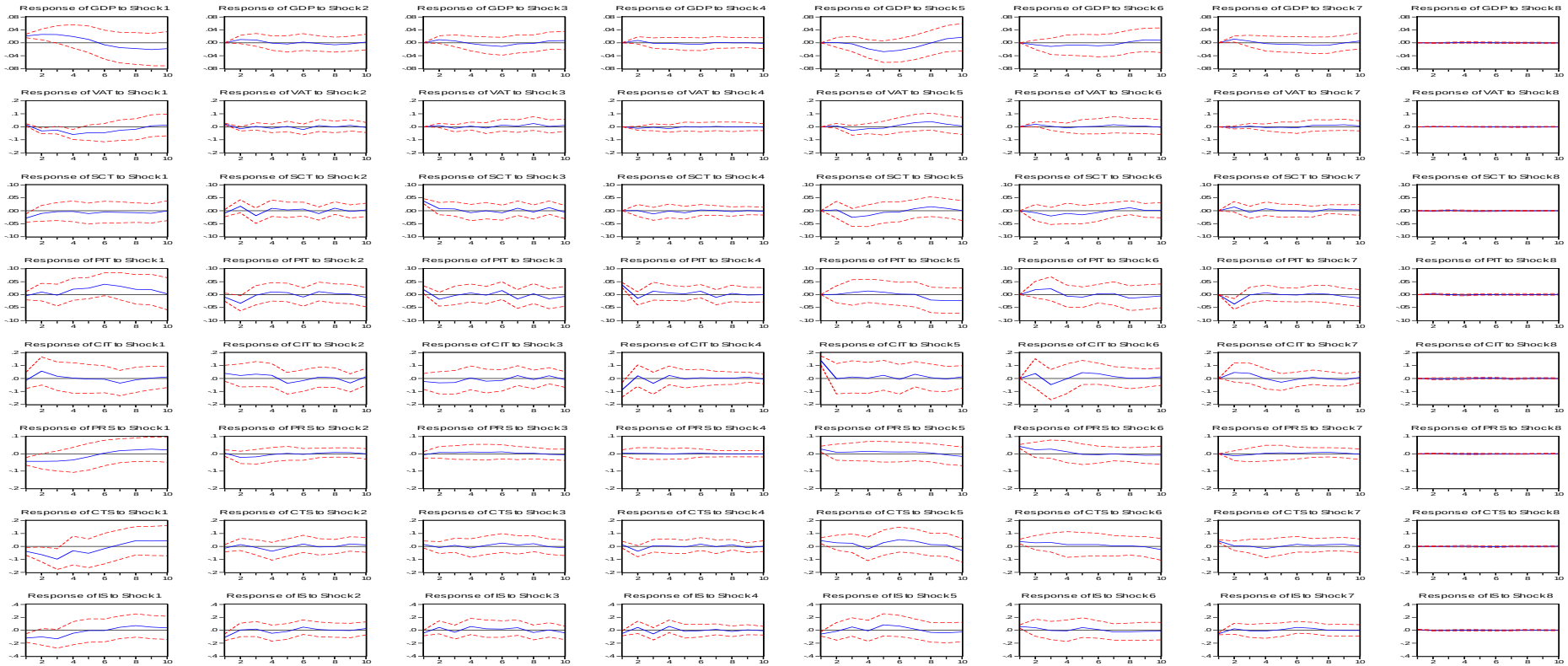
Figure 3 reports the results of impulse responses of each endogenous variable to the structural shocks for the short-run. The figure must be read in the following way: in the short-run and first period regarding the structuralized shock it can be observed that the effects of all variables are positive and significant on the GDP growth rate. And, for the last period of sample, both special consumption and corporate income tax have a negative effect on the GDP growth rate. In other words, a one standard deviation shock to special consumption tax, corporate income tax, personal spending resulted in an increase in the GDP growth rate after nearly the end of the eighth periods. On the other hand, long-run results can be viewed by the cumulative impulse response functions contained in Figure 4. For the first period, the impacts of personal income tax and current transfer spending on the GDP growth rate are negative, while that of special consumption tax is positive. Generally speaking, personal spending has a positive as well as significant effect on the GDP growth rate for the first three periods. As for current transfer spending and interest spending, their impacts turn out to be negative and stationary after the last period. All the findings are summarized in Table 5.

Table 5: Growth Enhancing Effect of Discretionary Fiscal Policy Shocks, 2006:Q1-2015:Q1

Fiscal Variables		Effect on GDP Growth Rate			
		In the Short-Run		In the Long-Run	
		Effect duration	Short-run Multiplier	Effect duration	Long-run Multiplier
Taxes	Value Added Tax ↑	first 4 period: ↑ from 7 to 9 period: ↓ after 9th period: stationary	0.16	first 5 period: ↑ after 5th period : ↓	-0.04
	Special Consumption Tax ↑	after 8th : ↑	0.50	from 4 to 7: ↓ after 8th : ↑	-0.01
	Personal Income Tax ↑	after 7th : stationary	-0.09	from 6 to 9th : ↑ after 9th : ↓	0.00
	Corporate Income Tax ↑	after 8th : ↑	0.65	from 4 to 9th : ↓ after 9th : ↑	0.04
Government Spending	Personal Spending ↑	after 8th : ↑	1.17	from 4 to 9: ↓ after 9th : ↑	-0.03
	Current Transfer Spending ↑	after 8th : ↑	2.65	after 8th : stationary after 9th : ↓	-0.03
	Interest Spending ↑	stationary	0.78	stationary	-0.10

Source: Prepared by the Authors

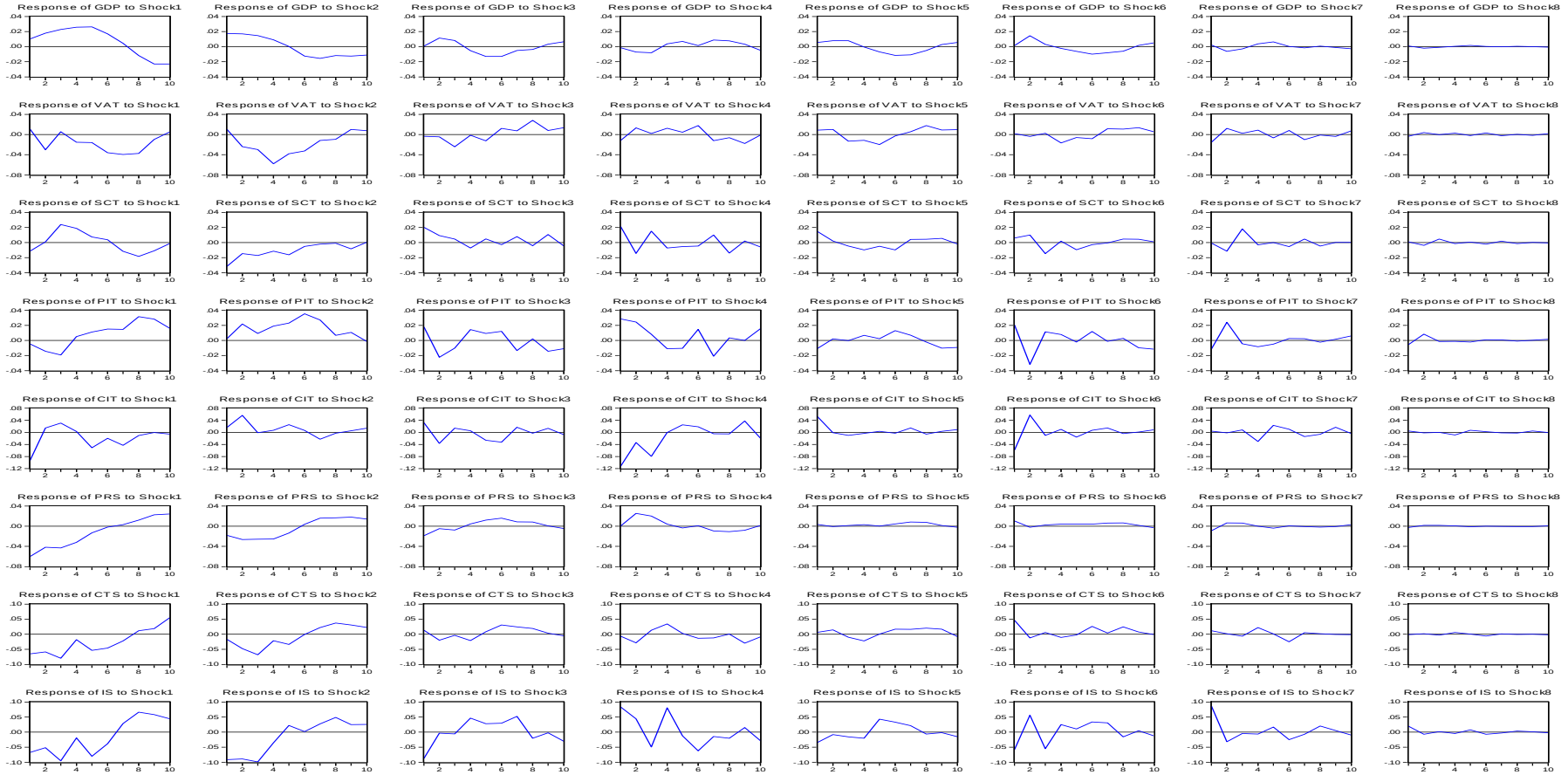
Figure 3: Short-Run Accumulated Impulse-Response Analyzis, 2006:Q1-2015:Q1



Note: The lines represent a gross domestic product shock (shock 1), value added tax shock (shock 2), special consumption tax shock (shock 3), personal income tax shock (shock 4), corporate income tax shock (shock 5), personal spending shock (shock 6), current transfer spending shock (shock 7), and interest spending shock (shock 8), respectively.

Source: Prepared by the Authors

Figure 4: Long-Run Accumulated Impulse-Response Analyzis, 2006:Q1-2015:Q1



Note: The lines represent a gross domestic product shock (shock 1), value added tax shock (shock 2), special consumption tax shock (shock 3), personal income tax shock (shock 4), corporate income tax shock (shock 5), personal spending shock (shock 6), current transfer spending shock (shock 7), interest spending shock (shock 8), respectively.

Source: Prepared by the Authors

6.2. Variance Decomposition

To indicate the relative importance of the shocks, it should be looked at variance decomposition analyzis. For this purpose, we estimate percentage of forecast variance to determine amount of shocks of variables.

Table 6 and 7 present the results obtained from the short- and long-run variance decomposition analyzis, respectively. As shown in Table 6, the GDP growth rate is mostly influenced by its own shocks during the first period of the sample. In the short-run, 9% of variation is accounted for by current transfer spending for the first period of the sample horizon. It is followed by the value added tax shock, accounting for 6.73% of variation on the GDP growth rate. For the last period, however, the results have changed dramatically. At the end of the sample, the most effective shocks on the GDP growth rate arise from corporate income tax shocks which account for 30.37 and personal spending shock which accounts for 7.21 % of variance, and then it is followed by special consumption tax shock with a 5.5% of variance.

Table 7 provides evidence on the relative importance of each of the long-run shocks. As shown from the table, the GDP growth rate is mostly explained by value- added tax shocks. At the beginning of the sample, value added tax shock (67.52%) is the most effective tax on the GDP growth rate in the long-run for the last period and corporate income tax becomes second (6.66%) after its own shocks. However, a conspicuous finding arising from the variance decomposition analyzis is that special consumption tax shocks as well as interest spending shocks have nearly no influence on the GDP growth rate at the beginning of the period for the long-run B-P SVAR.

The variance decomposition analyzis in the last period revealed that the most effective tax shock comes from value added tax by 22.23%. And then it is followed by special consumption tax (8.49%) for the last period of the sample. Overall, our empirical findings showed that in the short-run, the GDP growth rate is, mostly reacted to corporate income tax, as a sort of tax, and personal spending, as a sort of spending, for the last period of the short-run B-P SVAR. In the long-run, however, it is affected first by value added tax shocks after its own shocks, and then by special consumption tax shocks for the last period of the sample.

Table 6: Short-Run Forecast Error Variance Decomposition of GDP, 2006:Q1-2015:Q1

Period	S.E	Gross Domestic Product Shock (Shock 1)	Value Added Tax Shock (Shock 2)	Special Consumption Tax Shock (Shock 3)	Personal Income Tax Shock (Shock 4)	Corporate Income Tax Shock (Shock 5)	Personal Spending Shock (Shock 6)	Current Transfer Spending Shock (Shock 7)	Interest Spending Shock (Shock 8)
1	0.021129	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.039346	72.04238	6.739851	6.156049	3.549508	0.062800	2.419608	9.003128	0.026677
3	0.049847	71.38059	7.439286	5.265282	2.276733	0.520387	6.416687	6.683771	0.017266
4	0.057343	65.58721	5.649428	4.130456	1.783202	11.09421	6.478746	5.221206	0.055544
5	0.065751	52.52977	4.628814	4.617641	1.643294	25.92715	6.098335	4.493745	0.061243
6	0.071902	44.64704	3.982752	6.207909	1.813417	32.21899	6.802888	4.275289	0.051713
7	0.075632	44.21762	3.707996	5.806188	1.666120	32.70788	6.896177	4.950822	0.047201
8	0.078348	46.36605	4.008081	5.462730	1.552609	30.48044	6.619878	5.466229	0.043987
9	0.082828	47.85223	3.727007	5.438287	1.389536	29.50755	7.151953	4.892665	0.040772
10	0.087417	47.34817	3.430182	5.506074	1.271994	30.37627	7.210311	4.816073	0.040926

Source: Estimated by the Authors

Table 7: Long-Run Forecast Error Variance Decomposition of GDP, 2006:Q1-2015:Q1

Period	S.E	Gross Domestic Product Shock (Shock 1)	Value Added Tax Shock (Shock 2)	Special Consumption Tax Shock (Shock 3)	Personal Income Tax Shock (Shock 4)	Corporate Income Tax Shock (Shock 5)	Personal Spending Shock (Shock 6)	Current Transfer Spending Shock (Shock 7)	Interest Spending Shock (Shock 8)
1	0.021129	23.67381	67.52518	0.076530	0.459923	6.668294	0.487138	0.875165	0.233961
2	0.039346	27.45650	38.15713	8.200036	3.546520	6.056532	13.47817	2.783032	0.322076
3	0.049847	37.77819	32.24202	7.802892	4.807946	6.292072	8.768089	2.079721	0.229066
4	0.057343	48.57936	26.85314	6.747916	4.077022	4.764508	6.804824	1.992851	0.180375
5	0.065751	52.95141	20.42658	9.053034	4.196967	4.708795	6.053962	2.417409	0.191851
6	0.071902	49.84825	20.08405	10.80574	3.549989	6.557875	6.969752	2.023458	0.160896
7	0.075632	45.38092	22.31705	10.22314	4.584327	7.995037	7.472319	1.880835	0.146375
8	0.078348	44.58110	23.08540	9.744252	5.251732	7.878839	7.558453	1.759744	0.140474
9	0.082828	47.62851	22.95141	8.866022	4.859504	7.170083	6.806121	1.592564	0.125792
10	0.087417	49.62526	22.23730	8.495153	4.685275	6.843214	6.456516	1.539548	0.117731

Source: Estimated by the Authors

7. Concluding Remarks

In this paper, we predicted empirically the growth enhancing effect of discretionary fiscal policy shocks in both short- and long-run at component level in Turkey by applying the B-P SVAR technique to Turkish data, spanning from 2006:Q1 to 2015:Q1. To do so, we used the augmented version of the technique with eight variables, encompassing seven fiscal shock variables [four tax variables: value-added tax, special consumption tax, personal income tax and corporate income tax and three spending variables: personal spending, current transfer spending and interest spending], along with the GDP growth rate.

According to our findings, the growth enhancing effects of discretionary fiscal policy shocks change depending on its sub-components. More specifically, the growth enhancing effects of government spending shocks are relatively much larger than that of tax shocks. In the short-run, fiscal policy multiplier related to taxes appears to be lower than 1 or negative. Moreover, in the long-run, they become close to zero and/or become negative. Based on these findings, it can be argued that shocks to taxes create a very weak Keynesian effect and non-Keynesian effect in case of Turkey. Generally speaking, shocks to government spending have however, much stronger effect on growth in the short-run. For instance, the fiscal multiplier coefficient of personal spending is 1.17, whereas it becomes much stronger for current transfer spending, with a coefficient of 2.65. This indicates that government spending has the Keynesian effect in the short-run. However, in the long-run it appears that this effect turns to a very weak Keynesian and non-Keynesian.

In sum, based on all the findings above, it may be argued that in the long-run fiscal policy is an ineffective macroeconomic policy tool in stimulating growth. However, the only government spending is an effective fiscal policy tool which can spur growth in the short-run, but not in the long-run. The findings of the paper suggest that i) growth enhancing effect of discretionary fiscal policy reveals mixed results, depending on types of fiscal policy instruments —taxes and spending— and their components and time period; ii) shocks to taxes have either a weak Keynesian or non-Keynesian effect whatever the time period is; iii) shocks to government spending create the Keynesian effect, but in the long-run they become the non-Keynesian.

All these results may be attributed to numerous factors, such as country and government size, openness to trade, exchange rate regimes, interaction between monetary and fiscal policies, access to liquidity, crowding-out/-in effect of private sector, and so on. Further empirical research is needed in all these areas, examining the relationship between each of these factors and the growth enhancing effects of discretionary fiscal policy which are the subject of other studies.

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